REMARKS/ARGUMENTS

Introduction

Claims 1, 16, 17, 90, and 91 are amended. Claims 1-21 and 83-92 are now pending in the application. Applicants respectfully request reexamination and reconsideration of the application.

Regarding the 112 1st paragraph rejection

Claims 5-7 were rejected under 35 USC § 112, 1st paragraph on the grounds that the specification allegedly does not enable those claims because "[i]t is unclear . . . why depending on overlying or underlying the first material by the second material volume of the second material would increase or decrease." Applicants respectfully traverse this rejection.

Initially, Applicants note that claim 6 does not recite changing a volume, and claim 7 does not recite overlying or underlying. Applicants assume therefore that the rejection of claims 6 and 7 was a mistake as neither claim recites the features allegedly not enabled.

With regard to claim 5, Applicants note that claim 5 does not recite that the volume of the second element material changes because it overlies the first element material. The rejection thus appears to be based on a misreading of claim 5. Indeed, in reciting that "the second element material overlies the first element material," claim 5 is merely describing the relative position of the second element material with respect to the first element material—claim 5 is not reciting a cause of a volume change. Rather, claim 5 expressly states that a "volume of the second element material increases" "***in response to*** [an] ***external stimulus***." Applicants respectfully assert that the specification provides sufficient information to enable utilizing an external stimulus to cause a volume change in a second element material. For example, although claim 1 is not so limited, the specification teaches that heat can be an external stimulus that causes a volume change an element material. (See, e.g., specification pg. 27, lines 16-19.)

For at least the foregoing reasons, Applicants respectfully assert that the rejection of claims 5-7 under 35 USC 112, 1st paragraph should be withdrawn.

Regarding the 112 2nd paragraph rejection

Claims 16, 17, 90, and 91 were rejected under 35 USC § 112, 2nd paragraph on the grounds that the meaning of changing "to a previously defined shape" is unclear. Applicants respectfully assert that the PTO's reasoning is faulty. If a shape is currently not the "previously defined shape," then a "change" to the "previously defined shape" does indeed result in a different shape and thus a "change." Nevertheless, Applicants have amended claims 16, 17, 90, and 91 to clarify the claims (not for reasons of patentability), which Applicants believe moots the 112 2nd paragraph rejection of those claims. For at least these reasons, Applicants assert that the rejection of claims 16, 17, 90, and 91 should be withdrawn.

Regarding the 102(b) rejection

Claims 1-3, 8-11, 14, 15, 18, 19, and 21 stand rejected in view of U.S. Patent No. 5,613,861 to Smith et al. (Smith). Applicants respectfully traverse this rejection because Smith does not teach or suggest all of the features claim 1.

Claim 1 recites that "while the second end of the first element material is released from the substrate, the interconnection element maintains a first geometric shape before application of the external stimulus and changes to a second geometric shape in response to the application of the external stimulus." In other words, the interconnection element stays in a first geometric shape even while a first end of the first element material is released from the substrate. It is an external stimulus—not the releasing of the first end of the first element material—that causes the change from the first geometric shape to the second geometric shape. In contrast, as shown in Figures 10 and 11, Smith's interconnect element cannot remain in the shape shown in Figure 10 (which the PTO equated with the first geometric shape recited in claim 1) after an end of metal layer 16 is released from substrate 14 by removing under layer 13. This is because Smith's interconnection element is made of pre-stressed material. (See Smith Figure 8 and accompanying description in col. 5, lines 4-9). The stress is introduced in the metal from which the contact is formed in order to provide the force necessary for one end 11 to bend away from the substrate 14. Once released from the substrate 14 by removal of under layer 13 (see Figures 10 and 11), end 11 raises in order to equalize the stress gradient in the metal layer 16. In summary, but for the adhesion of end 11 to substrate 14 by under layer 13, the Smith's interconnection element bends into the shape shown in Figure 11 (which the PTO equated with

the second geometric shape recited in claim 1). Smith's interconnection element therefore does not—and indeed cannot—, "[maintain] a first geometric shape" "while the second end of the first element material is released from the substrate" and "before application of the external stimulus." For at least the foregoing reasons, Smith does not anticipate claim 1.

Moreover, Applicants assert that nothing in Smith teaches or suggests a modification that would result in end 11 remaining in the shape shown in Figure 10 even after under layer 13 is removed. Indeed, such a modification is not possible and would destroy the principles by which Smith's invention operates. Moreover, although claim 11 is not limited to the following advantages, Applicants note that the feature of the interconnection element remaining in the first geometric shape until an external stimulus is applied, provides advantages not found in Smith. For example, the foregoing feature of claim 11 allows an operator to control timing of the change from the first shape to the second shape. By controlling the timing of this change, additional processes may be performed while the interconnection element is in a first shape. For example, additional plating or other materials or layers can be applied to the interconnection element while the interconnection element is in the first shape. Again, although claim 1 is not limited to such advantages, Applicants note these advantages only to show that claim 1 is more advantageous than Smith and, for these as well as other reasons, is not obvious in view of Smith.

At least for the reasons discussed above, claim 1 distinguishes over Smith and should be allowed. Claims 2, 3, 8-11, 14, 15, 18, 19, and 21 depend from claim 1, and in addition to the features they individually recite, should be allowed because of their dependence on claim 1.

Regarding the 103(a) rejection

Claims 4-7 and 20 stand rejected under 35 USC § 103(a) as obvious in view of Smith and WO/99/14404 to Chen et al. (Chen). Applicant respectfully traverses this rejection.

Claims 4-7 and 20 depend from claim 1, and Smith does not teach or suggest at least certain features of claim 1 as discussed above. Chen does not make up for those deficiencies in Smith. Therefore, at least because of their dependency from claim 1, claims 4-7 and 20 are patentable over Smith and Chen.

Moreover, the teachings of Smith and Chen are not compatible, and the combination of Smith and Chen is therefore improper. More specifically, the PTO cites Chen for the use of heat treatment for improving an interconnection element's mechanical properties and/or reducing

inherent stress. Smith's teachings and Chen's teachings are incompatible because Smith intentionally introduces stress an the interconnection element in order to provide a stress gradient that causes a free end of the interconnection element to bend away from a substrate. Indeed, stress in the interconnection element is intentional in Smith but something to be eliminated in Chen. For at least the additional reason that the combination of Smith and Chen is thus improper, Applicants respectfully request that the rejection of claims 4-7 and 20 be withdrawn.

Claims 12 and 13 stand rejected under 35 USC § 103(a) as obvious in view of Smith and U.S. Patent No. 5,832,601 to Eldridge et al. ("Eldridge"). Claims 12 and 13 depend from claim 1 and are therefore, at least because of that dependency, patentable over Smith and Eldridge. Moreover, the PTO dismissed the use of "palladium or its alloy" and "palladium/cobalt" recited in claims 12 and 13 as mere "alternative material[s]." Applicants respectfully submit, however, that these features of claims 12 and 13 cannot be dismissed as mere "alternative material[s]." In some probing applications, palladium, palladium/cobalt, or other palladium alloys provide advantages not found in other materials. For example, in some probing applications, the use of palladium, palladium/cobalt, or other palladium alloys provide superior wear characteristics. These materials are thus not mere alternative material choices but provide advantages. Therefore, at least for the additional reason that the prior art lacks motivation or a suggestion to combine Eldridge's teachings regarding the use of palladium and its alloys with Smith's interconnection element, the rejection of claims 12 and 13 should be withdrawn.

Claims 83-89 stand rejected under 35 USC § 103(a) as obvious in view of Smith and U.S. Patent No. 5,979,892 to Smith ("Smith II"). As discussed above, Smith fails to teach or suggest at least certain features of claim 1. Smith II fails to make up for those deficiencies in Smith. Therefore, at least because of their dependency from claim 1, claims 83-89 are patentable over Smith and Smith II.

Conclusion

In view of the foregoing, Applicants submit that all of the claims are allowable and the application is in condition for allowance. If the Examiner believes that a discussion with Applicants' attorney would be helpful, the Examiner is invited to contact the undersigned at (801) 323-5934.

Respectfully submitted,

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